

MEMORANDUM

DATE: September 16, 2019

TO: James Webb
City of Auburn

FROM: Jeff Schramm / Curtis Chin, P.E.
TENW

SUBJECT: Prologis Hunt Site City Application No. SEP19-0002
Updated Traffic Impact Analysis
TENW Project No. 5776



9/16/19

This memorandum documents the updated traffic impact analysis (TIA) conducted for the proposed Prologis Hunt Site project located on the west side of West Valley Highway in the vicinity of S 285th Street in the City of Auburn, WA as shown in the **Figure 1** site vicinity map. This is an update to our previous TIA dated June 19, 2019, and addresses traffic comments included in the City of Auburn's August 1, 2019 *Request for Additional Information* which are included as **Attachment A**. In response to City comments, the proposed land use was revised to use the general light industrial land use category, ITE Land Use Code 110.

Executive Summary

Proposal. The proposed project includes the development of an approximately 195,000 square foot (SF) industrial building. Access to the site would be provided by a full access driveway on West Valley Highway north of S 285th Street. A secondary access is also proposed on the west side of the site through an internal driveway with the Prologis DCT Hudson site (currently under construction) that would provide access onto S 287th Street. The existing site includes two existing single family homes that would be removed as part of the proposed project. The expected year of opening is 2021.

Trip Generation. Based on use of ITE LUC 110 for General Light Industrial, the proposed Prologis Hunt project is estimated to generate 778 net new weekday daily trips with 72 trips occurring during the weekday AM peak hour (63 in, 9 out), and 56 trips occurring during the weekday PM peak hour (7 in, 49 out).

Level of Service Analysis. Level of service (LOS) analyses were conducted at two City of Auburn off-site study intersections: (1) West Valley Highway/S 287th Street and (2) West Valley Highway/37th Street NW/S 292nd Street. The results of the weekday AM and PM LOS analyses at the study intersections indicate that they are expected to operate at LOS C or better during the weekday AM peak hour and PM peak hours in 2021 without or with the proposed project.

Site Access Analysis. All movements at the proposed site access driveway on West Valley Highway are expected to operate at LOS D or better during both the weekday AM and PM peak hour with minimal queuing.

Impact Fees. The payment of transportation impact fees will mitigate project-related impacts. It is proposed that transportation impact fees will be determined in coordination with City staff, and paid at the time of building occupancy or until a specific user has been identified.

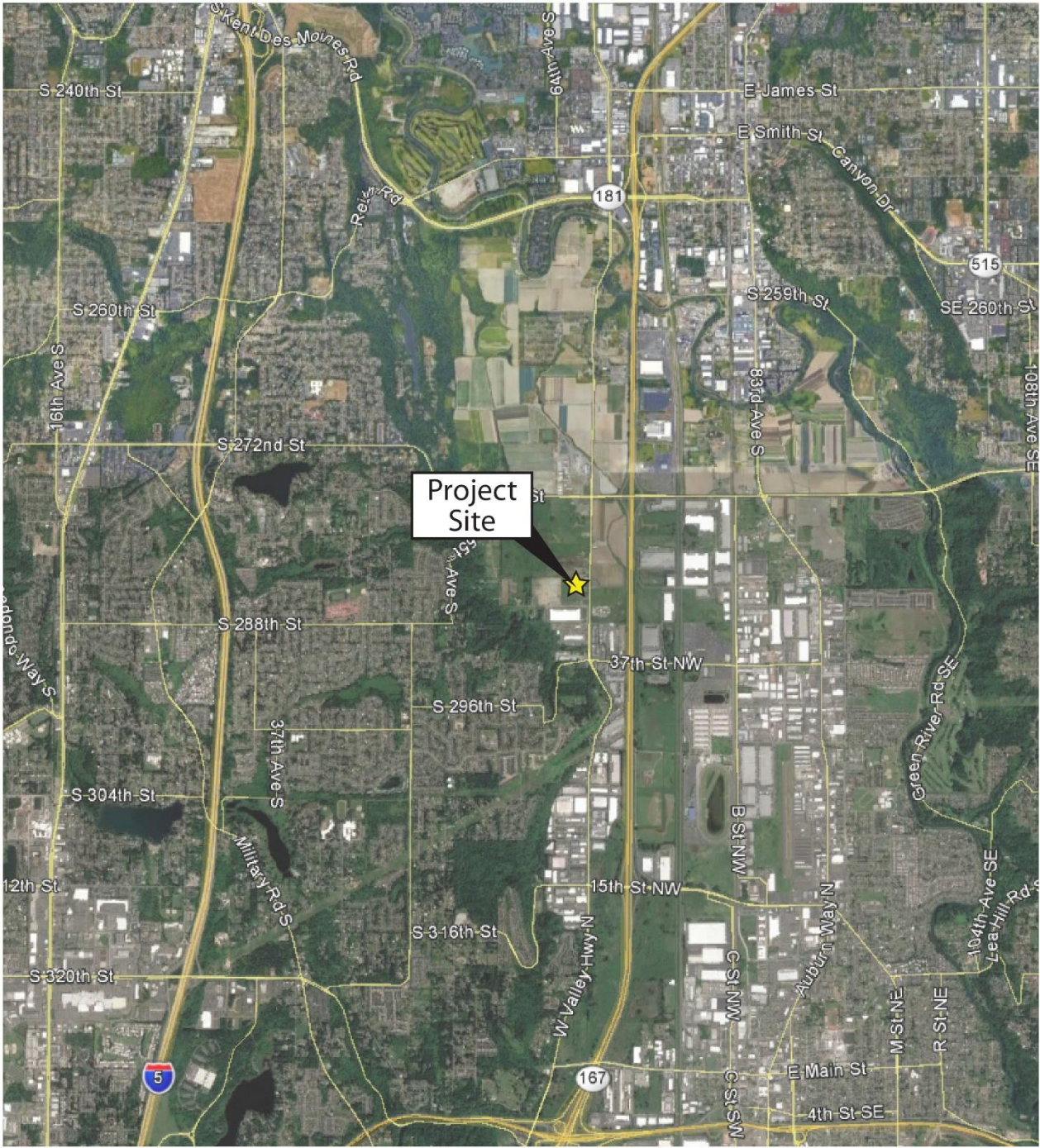


Figure 1: Project Site Vicinity



Introduction

The following items are addressed in this traffic impact analysis:

- Project Description
- Trip Generation
- Collision History
- Planned Improvements
- Level of Service Analysis
- Site Access Analysis
- Transportation Impact Fees

Project Description

The proposed project includes the development of an approximately 195,000 square foot (SF) industrial building. Access to the site would be provided by a full access driveway on West Valley Highway north of S 285th Street. A secondary access is also proposed on the west side of the site through an internal driveway with the Prologis DCT Hudson site (currently under construction) that would provide access onto S 287th Street. The existing site includes two existing single family homes that would be removed as part of the proposed project. The expected year of opening is 2021. A preliminary site plan concept is provided in **Figure 2**.

Trip Generation

A specific tenant has not yet been identified. Per City of Auburn comments, the general light industrial land use category (ITE LUC 110) was used for the trip generation estimate. The weekday daily, AM and PM peak hour trip generation estimates for the proposed project were based on methodology published in the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 10th Edition for land use code (LUC) 110 Light Industrial. Trip credit for the two existing homes to be removed was based on ITE LUC 210 Single Family.

The resulting new weekday daily, AM and PM peak hour trips are summarized in **Table 1**. A detailed trip generation estimate is included in **Attachment B**.

Table 1
Trip Generation Summary

Time Period	<u>Passenger Vehicle Trips</u>			<u>Truck Trips</u>			<u>Total Trip Generation</u>		
	In	Out	Total	In	Out	Total	In	Out	Total
Daily	337	337	674	52	52	104	389	389	778
AM Peak Hour	55	8	63	8	1	9	63	9	72
PM Peak Hour	6	42	48	1	7	8	7	49	56

As shown in **Table 1**, the proposed Prologis Hunt Site is estimated to generate 778 net new weekday daily trips with 72 trips occurring during the weekday AM peak hour (63 in, 9 out), and 56 trips occurring during the weekday PM peak hour (7 in, 49 out).



Collision History

Historic collisions at the study intersections and along the project frontage on West Valley Highway were analyzed for the three-year period from 2015 to 2017. Collision data was provided by the City of Auburn. Summaries of the total and yearly average collisions during this period are provided in **Table 2**. Summaries of collisions by type over the three-year period are provided in **Table 3**.

Table 2
Collision Data Summary, January 1, 2015 to December 31, 2017

Location	2015	2016	2017	Three-Year Total Collisions	Average Annual Collisions
1. West Valley Hwy at S 287 th St	1	0	0	1	0.33
2. West Valley Hwy at 37 th St NW/S 292 nd St	2	1	3	6	2.00
3. West Valley Hwy Project Frontage	1	1	1	3	1.00

Sources: City of Auburn Collision Records.

Table 3
Collision Data Summary by Type, January 1, 2015 to December 31, 2017

Location	3-Year Total Collisions	Average Annual Collision Rate	Collision Type					
			Approach Turn	Sideswipe	Right Angle	Rear-end	Parked Veh / Fixed	Other
1. West Valley Hwy at S 287 th St	1	0.33	0	0	0	1	0	0
2. West Valley Hwy at 37 th St NW/S 292 nd St	6	2.00	2	2	2	0	0	0
3. West Valley Hwy Project Frontage	3	1.00	0	0	0	2	1	0

Source: City of Auburn Collision Records.

The City collects and reviews collision data to identify intersection and road locations where potential hazards exist. Potential safety problems are identified using the Safety Priority Index System (SPIS) methodology. The SPIS score for a location considers three years of data and considers frequency, collision rate, and severity. Based on City's 2015-2017 SPIS, there were 104 intersections included and the SPIS scores ranged from 19.66 to 85.84 with a Citywide average of 49.15. The intersection of West Valley Highway at S 287th Street was not included on this list. The intersection of West Valley Highway at 37th Street NW/S 292nd Street was included on this list and has an SPIS score of 33.72 which is lower than the Citywide average and ranks #89 out of the 104 intersections.

Planned Transportation Improvements

This section documents the known transportation improvements planned by the City of Auburn in the study area. Planned transportation improvement projects are identified in the City of Auburn's adopted 2020-2025 *Transportation Improvement Program* (TIP). Based on our review of the City's current TIP, no City planned projects are included in the project vicinity.

Planned transportation improvements by others include the installation of a traffic signal at the intersection of West Valley Highway/S 287th Street which is currently under construction. In addition to the traffic signal, West Valley Highway is proposed to be widened to accommodate an exclusive northbound left-turn lane. As of the date of this study, the planned traffic signal and roadway widening on West Valley Highway are nearly complete.

Existing and Future Year Traffic Volumes

Existing weekday AM and PM peak hour traffic counts were conducted on Thursday, November 29, 2018 at the S 287th Street/West Valley Highway study intersection and on January 31, 2018 at the W Valley Highway/37th Street NW/S 292nd Street study intersection. The traffic count sheets are provided in **Attachment C**. Study intersections analyzed in this study were determined based on City of Auburn intersections impacted by 30 or more project trips.

The existing weekday AM and PM peak hour traffic volumes represent the highest hour of traffic between 7:00 and 9:00 a.m. and 4:00 and 6:00 p.m. respectively. The existing AM and PM peak hour traffic volumes at the two study intersections are shown in **Figure 3**.

The distribution of weekday AM and PM peak hour project trips was based existing travel patterns in the area. The peak hour project-generated vehicle trips were generally distributed as follows:

- 60 percent to/from the north on West Valley Highway
- 25 percent to/from the south on West Valley Highway (south of 37th Street NW)
- 10 percent to/from the east on 37th Street NW
- 5 percent to/from the west on S 292nd Street

Based on these trip distribution patterns, **Figure 4** shows the distribution and assignment of the AM and PM peak hour project trips through the study intersections and site access locations. While most project traffic will use the site access driveway on West Valley Highway, it is anticipated that some project trips may utilize the secondary access through the Prologis DCT Hudson site to access the S 287th Street traffic signal. The secondary access through the Prologis DCT Hudson site would likely be utilized during periods of high traffic volumes on West Valley Highway.

To estimate future 2021 baseline traffic volumes without the project at the study intersections, an annual growth rate of 2 percent was applied to the existing traffic volumes. In addition to the 2 percent annual background growth rate, trips from the following approved pipeline projects were included in the future baseline traffic volumes:

- North Auburn Logistics (located on the southwest corner of West Valley Highway/S 287th Street)
- Prologis DCT Hudson (located on the north side of S 287th Street west of West Valley Highway)

Figure 5 illustrates the future 2021 baseline AM and PM peak hour traffic volumes without the proposed Prologis Hunt Site project at the study intersections. To determine the future year with-project traffic volumes, the net new project-generated trips which are shown in **Figure 4** were added to the future baseline volumes to obtain future with-project traffic volumes. The resulting total with-project AM and PM peak hour traffic volumes at the study intersections and site access driveway are shown in **Figure 6**.

1 West Valley Hwy / S 287th St

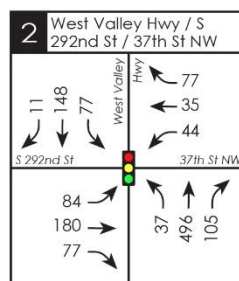
6
258

S 287th St

West Valley Hwy

3
5

13
634



West Valley Hwy / S 287th St

5

774

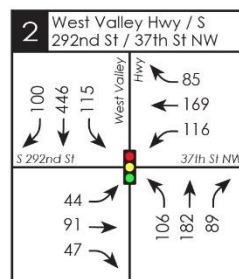
S 287th St

5

11

3

365



N

NOT TO SCALE

1 West Valley Hwy / S 287th St

2 West Valley Hwy / S 292nd St / 37th St NW

A West Valley Hwy / Site Access

B Internal Dwy with Prologis DCT Hudson Site

*Note: Gross Trips At The Driveways

1 West Valley Hwy / S 287th St

West Valley Hwy

S 287th St

17 (3)

3

2 West Valley Hwy / S 292nd St / 37th St NW

West Valley Hwy

S 292nd St

37th St NW

2

11 (2)

4 (1)

A West Valley Hwy / Site Access

West Valley Hwy

Site Access

4 (1)

1

(4) 23

(3) 17

B Internal Dwy with Prologis DCT Hudson Site

Prologis DCT Hudson Site

Prologis Hunt Site

3

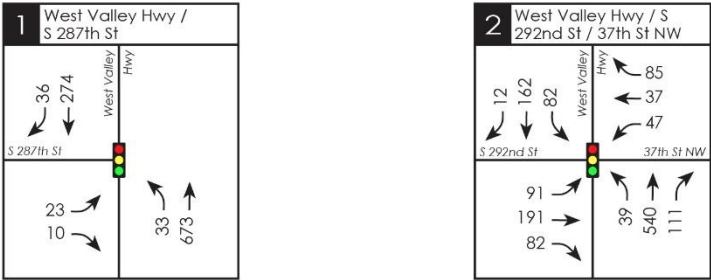
*Note: Gross Trips At The Driveways

N

NOT TO SCALE



AM Peak Hour



PM Peak Hour

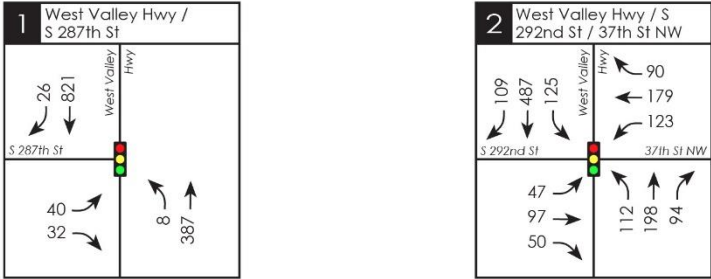
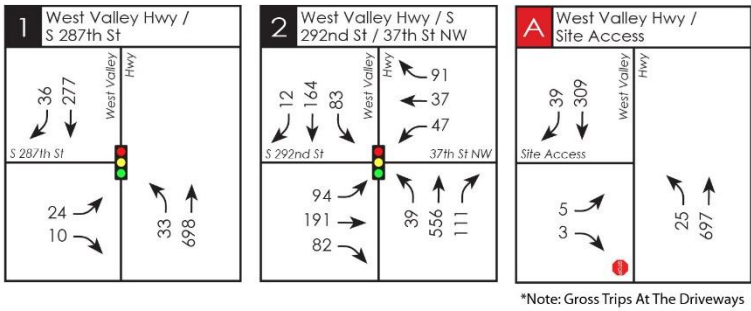


Figure 5: 2021 Without Project Weekday Peak Hour Traffic Volumes





AM Peak Hour



PM Peak Hour

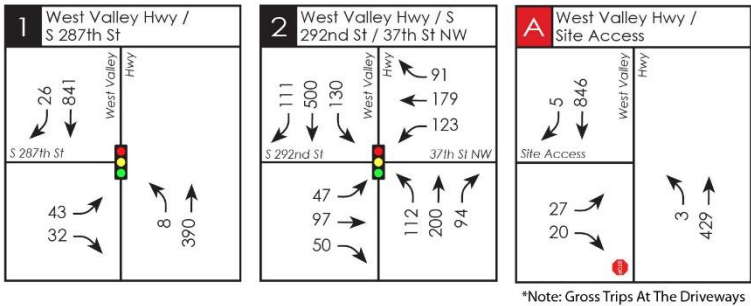


Figure 6: 2021 With Project Weekday Peak Hour Traffic Volumes

Level of Service Analysis

As of 2018, the intersection of West Valley Highway/S 287th Street was a stop-controlled T-intersection. Planned improvements at the intersection include widening West Valley Highway to include a northbound left-turn lane and a new traffic signal. These improvements are assumed to be completed prior to the 2021 year of opening for the Prologis Hunt Site project; note that the signal is currently under construction and is nearly complete.

Weekday AM and PM peak hour level of service (LOS) analyses at the study intersections were conducted using the methodologies and procedures outlined in the latest edition of the *Highway Capacity Manual* (6th Edition). LOS serves as an indicator of the quality of traffic flow and degree of congestion at an intersection or roadway segment. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. The LOS methodology is described in **Attachment D**. The *Synchro Version 10* software package was used to determine LOS.

Table 4 summarize the existing 2018 existing and future 2021 LOS results at the study intersections. The detailed LOS calculations sheets are included in **Attachment D**.

Table 4
Peak Hour LOS Summary

Site Access / Movement	2018 Existing		2021 Without Project ³		2021 With Project ³	
	LOS ¹	Delay (sec) ²	LOS ¹	Delay (sec) ²	LOS ¹	Delay (sec) ²
Weekday AM Peak Hour						
West Valley Highway/S 287 th Street (Stop Sign)						
Northbound Left-Turn	A	8.3	-	-	-	-
Westbound Shared Left/Right	B	13.2	-	-	-	-
<u>Signalized Intersections</u>						
West Valley Highway/S 287 th Street	-	-	A	7.0	A	6.9
West Valley Highway/37 th Street NW/ S 292 nd Street	C	25.9	C	28.6	C	29.4
Weekday PM Peak Hour						
West Valley Highway / S 287 th Street (Stop Sign)						
Northbound Left-Turn	A	9.4	-	-	-	-
Westbound Shared Left/Right	C	18.1	-	-	-	-
<u>Signalized Intersections</u>						
West Valley Highway/S 287 th Street	-	-	B	10.7	B	10.9
West Valley Highway/37 th Street NW/ S 292 nd Street	C	27.0	C	30.3	C	31.2

¹ LOS = Level of Service.

² Delay refers to average control delay in seconds per vehicle.

³ Future 2021 analysis includes planned traffic signal and associated channelization improvements.

As shown in **Table 4**, the results of the weekday AM and PM LOS analyses at the study intersections indicate that they are expected to operate at LOS C or better during the weekday AM peak hour and PM peak hours in 2021 without or with the proposed project.

Site Access Operations

Access to the site would be provided by a full access driveway on West Valley Highway located on the north end of the site as far north of S 285th Street as possible. A secondary access is also provided through the Prologis DCT Hudson site (currently under construction) that would provide access onto S 287th Street, and the new signal at West Valley Highway.

As part of the Prologis Hunt Site project, West Valley Highway will be widened along the project frontage to include a center two-way left-turn lane. The widening would only occur along the property frontage which would result in a center turn lane to be used by northbound left-turns into the site and southbound left-turns from West Valley Highway at S 285th Street.

It should be noted that the location of the proposed driveway on West Valley Highway requires a deviation from City of Auburn driveway spacing standards given the proposed driveway location relative to S 285th Street. A deviation request was previously submitted to the City of Auburn.

To evaluate the operations of the proposed site access driveway on West Valley Highway, peak hour LOS and queue analysis were completed. The weekday AM and PM peak hour LOS and queue analysis at the proposed West Valley Highway site access driveway were based on the methodology outlined in the 6th Edition of the *Highway Capacity Manual* using Synchro software. The estimated future weekday AM and PM peak hour traffic volumes with the proposed project at the West Valley Highway site driveway used in the analysis are shown in **Figure 6**.

Table 5 summarizes the calculated LOS and the 95th percentile queues of the controlled movements at the proposed site access driveway during the weekday AM and PM peak hours. The reported 95th percentile queues represent a condition that is exceeded only 5 percent of the time. Detailed LOS and queue calculation worksheets are included in **Appendix D**.

Table 5
Site Access – AM and PM Peak Hour LOS/Queue Summary

Time Period/Movement	LOS	2021 With Project	
		Delay (sec)	95 th -percentile Queue (ft)
<u>AM Peak Hour</u>			
West Valley Highway / Proposed Site Access			
NB Left-Turn (entering)	A	8.1	<25'
EB shared Left-Right (exiting)	C	18.1	<25'
<u>PM Peak Hour</u>			
West Valley Highway / Proposed Site Access			
NB Left-Turn (entering)	A	9.8	0'
EB shared Left-Right (exiting)	D	28.9	25'

As shown in **Table 5**, the controlled movements at the proposed site access driveway on West Valley Highway are expected to operate at LOS D or better during both the weekday AM and PM peak hour with minimal queuing.

Transportation Impact Fees

The payment of transportation impact fees will mitigate project-related impacts to the City of Auburn transportation system. It is proposed that transportation impact fees will be determined in coordination with City staff, and paid at the time of building occupancy or until a specific user has been identified.

If you have any questions regarding the information presented in this Traffic Impact Analysis, please call Curtis at 206-714-7421 or email at chin@tenw.com.

cc: Justin Kirk, Prologis

Attachments

ATTACHMENT A

City of Auburn Comments Dated August 1, 2019

Via Email

August 1, 2019

Jason Hubbell
Barghausen Consulting Engineers, Inc.
18215 72nd Ave. S.
Kent, WA 98032
jhubbell@barghausen.com

**Re: Application No. SEP19-0002, Prologis Hunt Site
Notice of Complete Application and Request for Additional Information**

Dear Mr. Hubbell:

Thank you for the June 20, 2019 resubmittal of the above referenced application. The purpose of this letter is twofold: 1) to advise you that the submittals have been reviewed by the various departments and the applications are considered “**complete**” (as of July 18, 2019); and, 2) additional information is needed to continue processing of the applications. City Staff has the following comments, as well as “redline” comments on the documents listed below. These redlined documents are available for download at the following link:

https://www.dropbox.com/sh/l77n04vp8tkymp5/AADkM7LPuCoQqJ7_fk9f2ylna?dl=0.

For general comments please contact Thaniel Gouk, Senior Planner, tgouk@auburnwa.gov or 253-804-5031

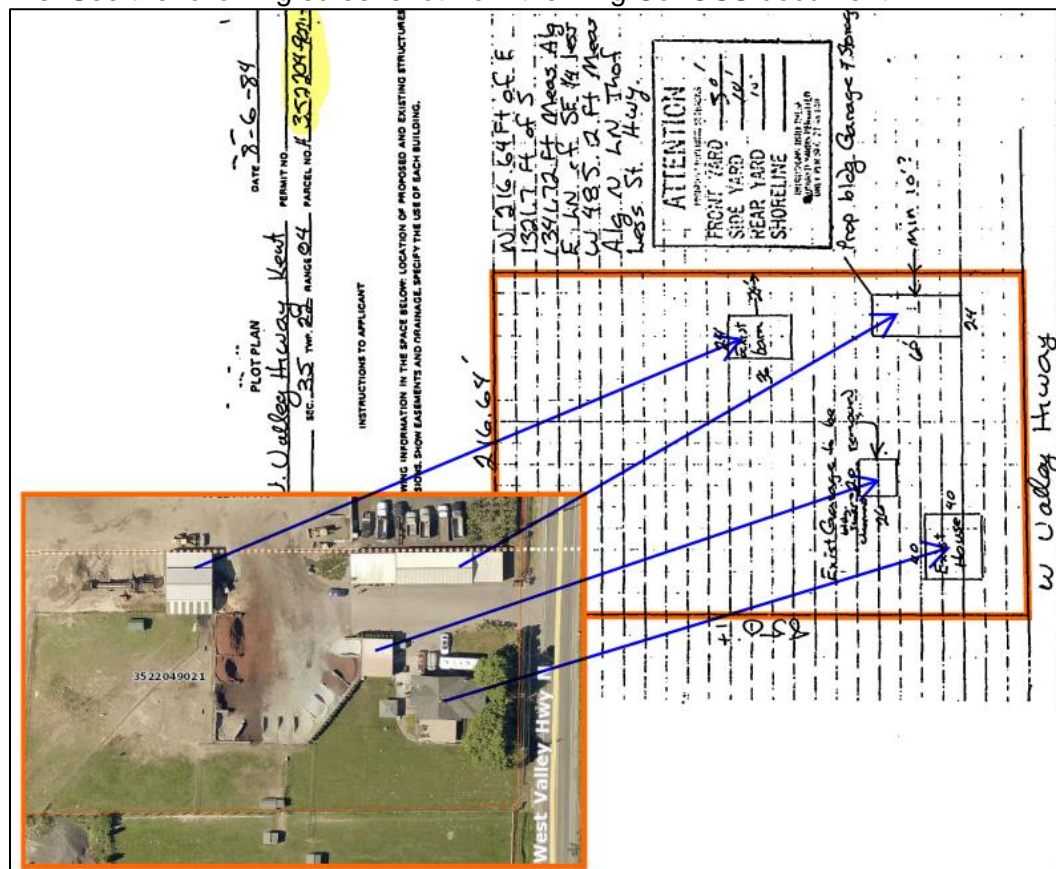
For Engineering or other Public Works related comments please contact Steve Sturza, Development Review Engineer, ssturza@auburnwa.gov or 253-876-1969.

1. Based on the comments below and in the referenced documents, substantial changes to the site plan and/or project may be necessitated.
2. SEPA Checklist: please clearly indicate the revision date on the first page of the checklist when resubmitting. Revisions made to the Checklist should be in a different font/style than the original.
3. SEPA Checklist: #9: this project will also require approval from King County for the street taper per AASHTO requirements in West Valley Hwy., north of the project.
4. SEPA Checklist: #10: the checklist should make note of any Army COE permitting or approvals that are required, if applicable.
5. SEPA Checklist, Water(A)(3): see comments under “Critical Areas Report”, below.
6. SEPA Checklist, Utilities(B): in this response, the applicant indicates that public sewer will be extended to the site, and on the accompanying civil plans, the applicant is showing a

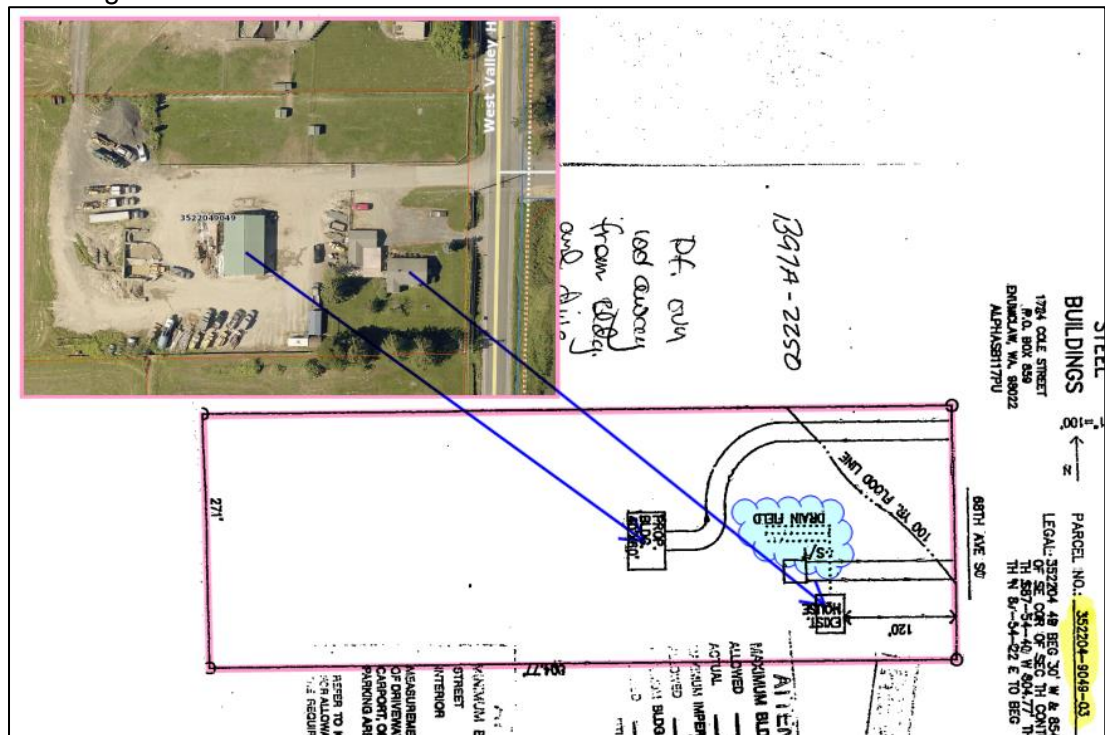
public sewer extension through private property west of the proposed project. It is not clear that there is adequate room for all the utilities shown (or not shown) in the neighboring parcel's parking lot - See the redlines on the revised civil plans. Please show all existing and proposed utilities, including water, storm drainage, both sewer lines, and any dry utilities and account for adequate spacing to ensure the project can be built reasonably close to what is proposed.

7. Critical Areas Report (ILF Plan): Staff has reviewed the Soundview proposal to fill the three wetlands located on the site and utilize the King Co. In-Lieu Fee (ILF) program to offset the fill, along with the City's consultant (Raedeke) review of the proposal and Soundview's rebuttal to the Raedeke review. Soundview's proposal includes 1.241 credits to be purchased from the ILF program; Raedeke's review shows a total of 3.195 credits that would need to be purchased. The City stands by Raedeke's review of the proposal for the following reasons:

- a. Septic location(s). According to the information provided by Soundview in "reviewing survey data" there is a septic field located north of the house on Parcel No. 352204-9021 (the northern parcel), however, the OSS [record](#) from 1984 seems to indicate that an as-built is not available and does not show a location for the drainfield. Also, it is unclear what survey is being referenced as the ALTA (by Barghausen, 8/28/2018) notes that "underground utilities and features depicted hereon are bases on field observation, development plans, and/or available record documents only..." and the only item shown on the drawing is the septic tank lid on the northern property line. See the following screenshot from the King Co. OSS document:



The Soundview report goes on to note that there is no septic location available on Parcel No. 352204-9049, however, it appears from the King Co. OSS [records](#) that the drainfield may be located in the grassy area north of the driveway off of West Valley Hwy. Note that the driveway location shown to the building located west of the house is not accurate which is not atypical for septic drawings (the current driveway configuration is also the same as shown on aerials back to about 1998). See the following screenshot from that document:



Based on the aerial images, the OSS documents available, the lack of information from Soundview showing other probable locations for the septic drainfields, and the location of the undeveloped (i.e. grass/pasture areas) north of the home on -0949 and south of the home on -0921, Staff concludes that there are septic systems within 250 feet of the wetlands and therefore box D 2.3 should have a score of “1” on the credit-debit worksheets and thereby increasing the “rating of landscape potential” from “M” to “H” (i.e. from “1 or 2” to “3 or 4”) for Wetlands A and B, as well as Wetland C (see following comment).

In addition to the septic field locations related to the credit-debit worksheets for all the wetlands, box D 2.1 should also be a “1” instead of a “0” according to Soundview’s report which states they all receive “surface sheet flow”. Again, this would increase the landscape potential for the wetlands from an M to an H.

- b. Wetland C. Soundview proposes that this wetland is a slope wetland and after Raedeke’s review they classify the wetland as depressional. Soundview contends that it is a slope wetland based on (in general) the wetland drains in one direction

and does not impound water. Raedeke's classification differs from both of these contentions, which Staff also believes to be the case, per the following:

- i. Based on the 2004 ECY rating manual, slope wetlands "*Flow in one direction...and the gradient is steep enough that the water is not impounded*"; based on both Raedeke's and Staff's visit to the site, this does not appear to be applicable to this wetland. A slight slope from west to east, towards the road-side ditch is present, however, according to the wetland delineation by Soundview, the wetland ends at the fence along West Valley Hwy., before the slope drops off to the ditch, thus not meeting this portion of the definition for a slope wetland.
- ii. In addition, the wetland does receive backflow, as was noted in Soundview's report, although it was indicated as "artificial" in an area that has historically dealt with flooding issues, meaning the wetland does not have a "unidirectional flow to the east", as is evidenced by Raedeke's site visit in early Spring 2019 (which is when hydrology is often monitored for wetlands), in the Google Street View image from August 2017, and as well as a King Co. flood photo from 1995:

Photo 1 Raedeke Spring 2019



Photo 2 Google Street View August 2017

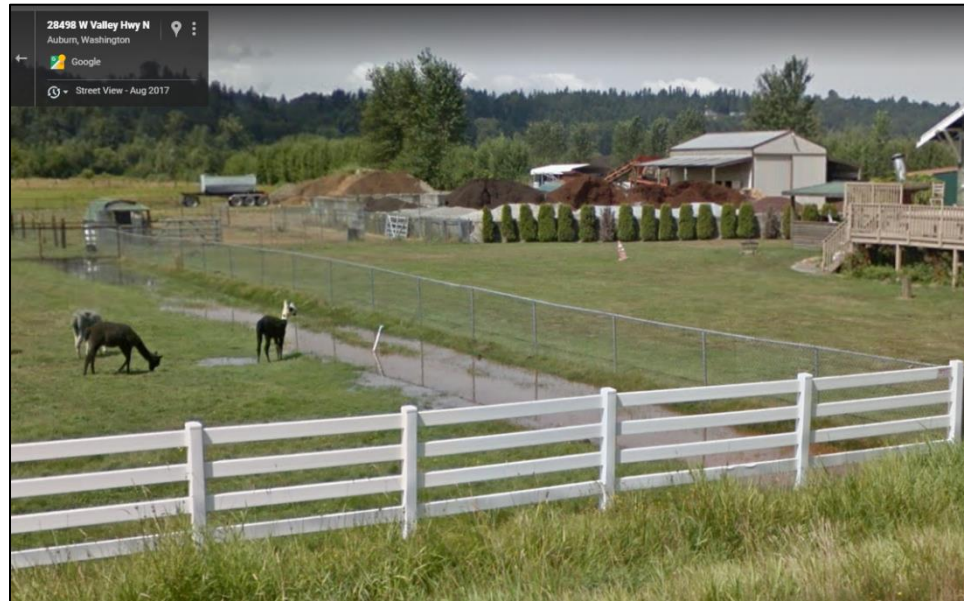


Photo 3 1995 King Co. Flood Photo



These photos also show that surface ponding is, in fact, present at times which is consistent with the 2004 ECY rating manual which states *"If a wetland has surface ponding, even if only for a short time, and is not lake-fringe, or riverine, it can be classified as depressional..."* As Raedeke has noted, during their site visit "...this wetland feature appears to be ponded more than 10% of the wetland and at a diameter that is more than 3 feet (a note to be considered when deciding if it is a slope HGM class or not)". In addition the manual states if *"...you have more than two HGM classes within a wetland boundary, classify the wetland as depressional for the rating."*

Based on these findings, Wetland C should be rated as a depressional wetland, and the ratings forms and credit-debit worksheet updated to reflect this. The number of credits that

will need to be purchased from the King Co. ILF program will therefore need to be 3.195. The Applicant will have two options to address this discrepancy; per WAC 197-11-350 the Applicant may request Soundview to revise their proposal to accurately reflect the number of credits that are required to offset filling of the wetlands and a SEPA Determination of Non-Significance (DNS) can be issued, or, the City will issue a Mitigated DNS (MDNS) that will include a mitigation measure to purchase the correct number of credits.

8. Traffic Impact Analysis: The study is required to be revised to use the general light industrial land use category, ITE #110. Based on the size of the proposed building the use of the industrial park land use is not appropriate. This will result in an increase in project trip generation compared with the current analysis which may require the inclusion of additional intersections.
9. Critical Aquifer Recharge Area Study: the City is still in the process of contracting with a consultant to perform this review. Once this review has been completed, this comment letter will be supplemented with that information. Please contact Susan Fenhaus, Water Utilities Engineer, sfenhaus@auburnwa.gov for additional information.

Conclusion

As soon as we receive the requested information, we will continue with review of the applications. To resubmit the requested materials, please upload the submittal packet to the project's Dropbox folder [here](#). After uploading, please send an email to applications@auburnwa.gov to notify us that the documents are available for our review and allow until the end of the following business day for a response.

All documents shall be submitted in *unsecured* and *flattened* PDF format. Each document shall be separate PDF documents and clearly named by document title (common acronyms are OK, e.g. SSP – Stormwater Site Plan/Report, *Geotech* – Geotechnical Report, *TIA* – Traffic Impact Analysis/Study/Memo, *CAR* – Critical Areas Report). Example: Smith Building – Prelim SSP.pdf.

Should you have any questions regarding this letter, please contact me at 253-804-5031 or tgouk@auburnwa.gov.

Sincerely,



Thaniel Gouk
Senior Planner
Department of Community Development

ATTACHMENT B

Trip Generation

Hunt Site - Auburn Trip Generation Summary

		ITE	Directional Distribution			Trips Generated			Truck Trip Generation				Non-Truck Trip Generation		
Land Use	Units ¹	LUC ²	In	Out	Trip Rate	In	Out	Total	Truck % ³	Enter	Exit	Total	Enter	Exit	Total
Weekday Daily															
Proposed Use:															
Light Industrial	195,000 GFA	110	50%	50%	EQN	399	398	797	13%	52	52	104	347	346	693
Less Existing Use:															
Single-Family Home	2 DU	210	50%	50%	9.44	-10	-9	-19	-	-	-	-	-10	-9	-19
Net New Daily Trips =						389	389	778	52	52	104	337	337	674	
Weekday AM Peak Hour															
Proposed Use:															
Light Industrial	195,000 GFA	110	88%	12%	EQN	64	9	73	13%	8	1	9	56	8	64
Less Existing Use:															
Single-Family Home	2 DU	210	25%	75%	0.74	-1	0	-1	-	-	-	-	-1	0	-1
Net New AM Peak Hour Trips =						63	9	72	8	1	9	55	8	63	
Weekday PM Peak Hour															
Proposed Use:															
Light Industrial	195,000 GFA	110	13%	87%	EQN	8 E	50	58	13%	1	7	8	7	43	50
Less Existing Use:															
Single-Family Home	2 DU	210	63%	37%	0.99	-1	-1	-2	-	-	-	-	-1	-1	-2
Net New PM Peak Hour Trips =						7	49	56	1	7	8	6	42	48	

Notes:

1. GFA = Gross Floor Area.

2. Land Use Code and trip rates based on ITE *Trip Generation* Manual, 10th Edition, 2017.

3. Truck percentage based on ITE *Trip Generation Handbook*, 3rd Edition, 2017 for LUC 130 (Industrial Park).

ATTACHMENT C

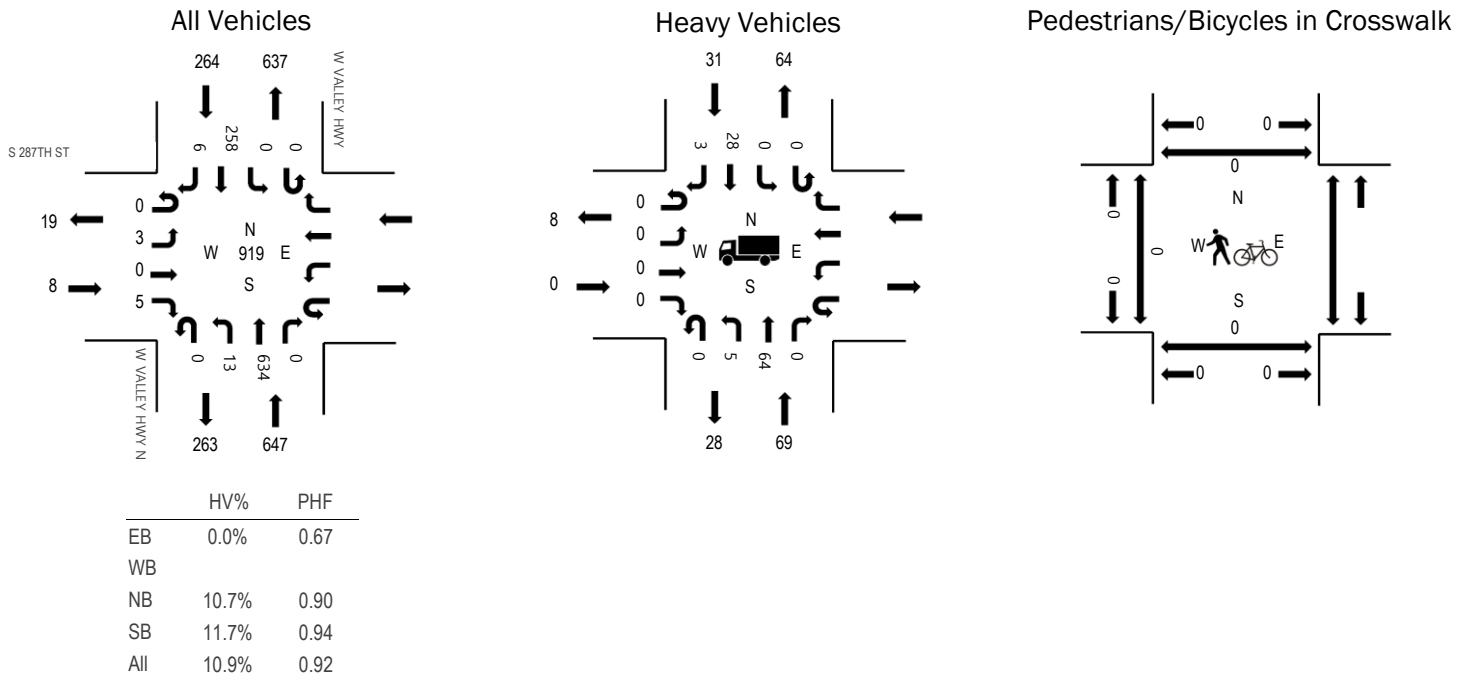
Existing Traffic Counts



Location: 1 W VALLEY HWY N & S 287TH ST AM
 Date and Start Time: Thursday, November 29, 2018
 Peak Hour: 07:00 AM - 08:00 AM

(303) 216-2439
 www.alltrafficdata.net

Peak Hour



Traffic Counts - All Vehicles

Interval Start Time	S 287TH ST Eastbound				Westbound				W VALLEY HWY N Northbound				W VALLEY HWY N Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	1	0	1					0	3	160	0	0	0	56	3	224	919
7:15 AM	0	0	0	2					0	4	176	0	0	0	67	0	249	886
7:30 AM	0	0	0	1					0	5	150	0	0	0	66	2	224	854
7:45 AM	0	2	0	1					0	1	148	0	0	0	69	1	222	823
8:00 AM	0	4	0	1					0	1	121	0	0	0	61	3	191	806
8:15 AM	0	3	0	5					0	5	125	0	0	0	78	1	217	
8:30 AM	0	3	0	4					0	1	131	0	0	0	53	1	193	
8:45 AM	0	2	0	0					0	1	124	0	0	0	78	0	205	
Count Total	0	15	0	15					0	21	1,135	0	0	0	528	11	1,725	
Peak Hour	0	3	0	5					0	13	634	0	0	0	258	6	919	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	14		8	22	7:00 AM	0	0		0	0
7:15 AM	0	13		7	20	7:15 AM	0	0		0	0
7:30 AM	0	21		6	27	7:30 AM	0	0		0	0
7:45 AM	0	21		10	31	7:45 AM	0	0		0	0
8:00 AM	1	21		5	27	8:00 AM	0	0		0	0
8:15 AM	1	10		13	24	8:15 AM	0	0		0	0
8:30 AM	1	10		6	17	8:30 AM	0	0		0	0
8:45 AM	0	14		14	28	8:45 AM	0	0		0	0
Count Total	3	124		69	196	Count Total	0	0		0	0
Peak Hour	0	69		31	100	Peak Hour	0	0		0	0



Prepared for: **City of Auburn**
Traffic Count Consultants, Inc.

Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

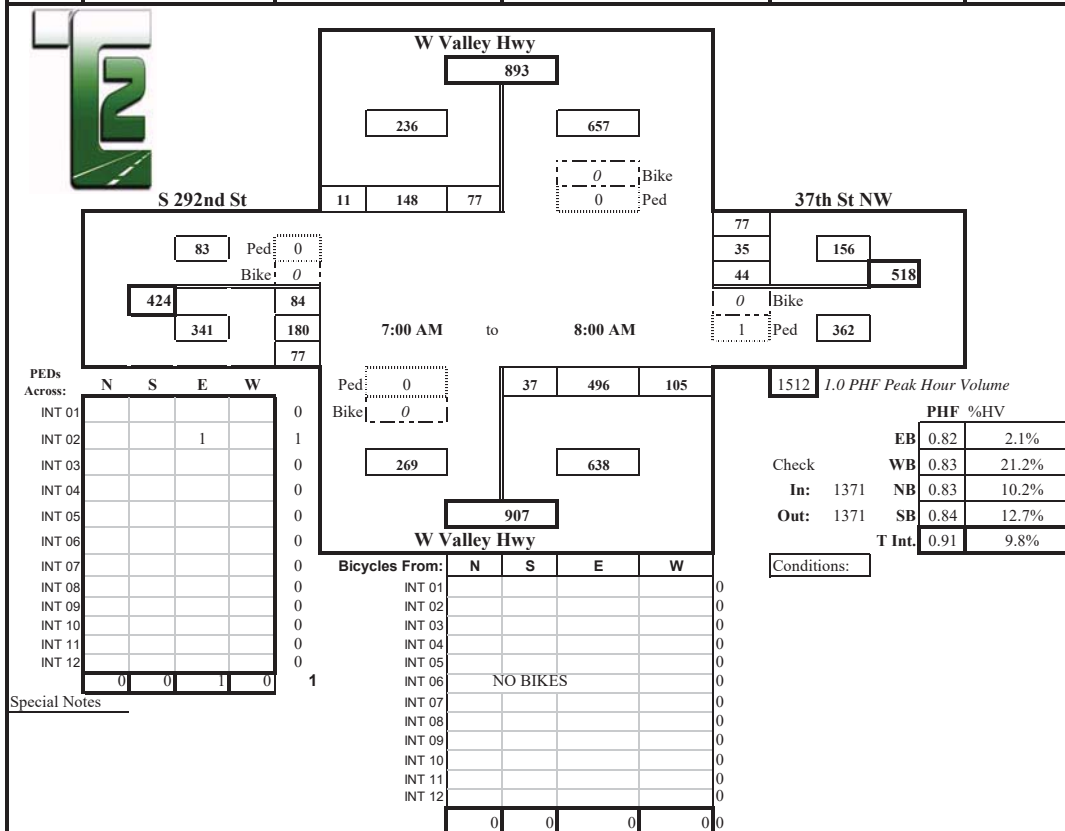
WBE/DBE

Intersection: W Valley Hwy & 37th St NW/S 292nd St
Location: Auburn, Washington

Date of Count: Wed 1/31/2018
Checked By: Jess

Time Interval Ending at	From North on (SB) W Valley Hwy				From South on (NB) W Valley Hwy				From East on (WB) 37th St NW				From West on (EB) S 292nd St				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	7	14	33	4	17	12	157	23	4	9	4	13	1	17	31	15	332
7:30 A	3	17	34	2	12	6	105	33	12	14	7	25	1	25	42	14	324
7:45 A	9	20	39	3	12	6	115	24	6	9	8	20	2	20	49	24	337
8:00 A	11	26	42	2	24	13	119	25	11	12	16	19	3	22	58	24	378
8:15 A	13	24	47	8	16	10	94	26	11	18	8	17	2	18	28	16	314
8:30 A	14	29	42	4	15	9	78	20	12	16	12	24	3	13	27	14	288
8:45 A	10	18	34	7	21	11	81	16	12	13	8	19	0	10	26	12	255
9:00 A	15	21	42	7	11	12	66	14	16	27	7	20	4	15	33	21	285
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Total Survey	82	169	313	37	128	79	815	181	84	118	70	157	16	140	294	140	2513
Peak Hour: 7:00 AM to 8:00 AM																	
Total	30	77	148	11	65	37	496	105	33	44	35	77	7	84	180	77	1371
Approach	236				638				156				341				1371
%HV	12.7%				10.2%				21.2%				2.1%				9.8%
PHF	0.84				0.83				0.83				0.82				0.91

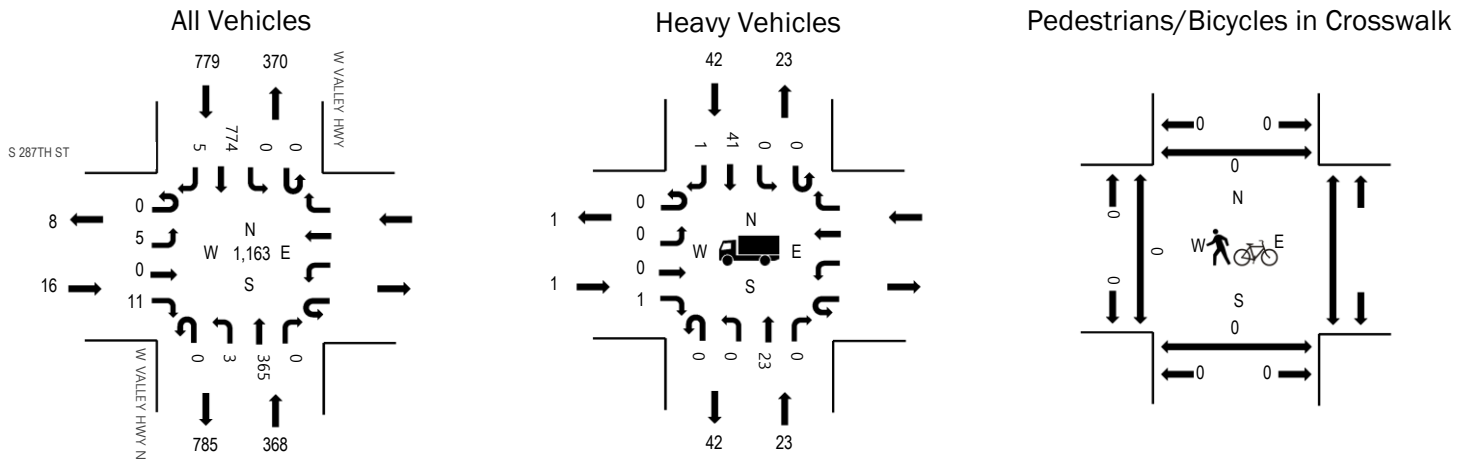




(303) 216-2439
www.alltrafficdata.net

Location: 1 W VALLEY HWY N & S 287TH ST PM
Date and Start Time: Thursday, November 29, 2018
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour



	HV%	PHF
EB	6.3%	0.67
WB		
NB	6.3%	0.91
SB	5.4%	0.90
All	5.7%	0.95

Traffic Counts - All Vehicles

Interval Start Time	S 287TH ST Eastbound				Westbound				W VALLEY HWY N Northbound				W VALLEY HWY N Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	4					0	0	101	0	0	0	183	1	289	1,163
4:15 PM	0	1	0	3					0	1	83	0	0	0	215	2	305	1,133
4:30 PM	0	4	0	2					0	1	93	0	0	0	183	0	283	1,082
4:45 PM	0	0	0	2					0	1	88	0	0	0	193	2	286	1,043
5:00 PM	0	1	0	1					0	3	72	0	0	0	181	1	259	992
5:15 PM	0	0	0	3					0	2	70	0	0	0	178	1	254	
5:30 PM	0	0	0	1					0	0	53	0	0	0	190	0	244	
5:45 PM	0	0	0	0					0	2	59	0	0	0	174	0	235	
Count Total	0	6	0	16					0	10	619	0	0	0	1,497	7	2,155	
Peak Hour	0	5	0	11					0	3	365	0	0	0	774	5	1,163	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	7		16	23	4:00 PM	0	0		0	0
4:15 PM	1	7		6	14	4:15 PM	0	0		0	0
4:30 PM	0	3		7	10	4:30 PM	0	0		0	0
4:45 PM	0	6		13	19	4:45 PM	0	0		0	0
5:00 PM	0	2		10	12	5:00 PM	0	0		1	1
5:15 PM	0	3		13	16	5:15 PM	0	0		0	0
5:30 PM	1	0		8	9	5:30 PM	0	0		0	0
5:45 PM	0	3		13	16	5:45 PM	0	0		0	0
Count Total	2	31		86	119	Count Total	0	0		1	1
Peak Hour	1	23		42	66	Peak Hour	0	0		0	0

ATTACHMENT D

Level of Service Results

Level of Service Methodology

Level of service calculations for intersections were based on methodology and procedures outlined in the 2016 update of the *Highway Capacity Manual*, Transportation Research Board (6th Edition) using *Synchro 10* traffic analysis software.

LOS generally refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections represents the average control delay (sec/veh) and can be reported for the overall intersection, for each approach, and for each lane group (additional v/c ratio criteria apply to lane group LOS only).

The LOS reported at stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (and for the overall intersection at all-way stop controlled intersections. Additional v/c ratio criteria apply to lane group or movement LOS only).

Table D1 outlines the current HCM (6th Edition) LOS criteria for signalized and stop-controlled intersections based on these methodologies.

Table D1
LOS Criteria for Signalized and Stop Controlled Intersections¹

<u>SIGNALIZED INTERSECTIONS</u>			<u>STOP-CONTROLLED INTERSECTIONS</u>		
Control Delay (sec/veh)	<u>LOS by Volume-to Capacity (V/C) Ratio²</u>		Control Delay (sec/veh)	<u>LOS by Volume-to Capacity (V/C) Ratio³</u>	
	≤ 1.0	> 1.0		≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

¹ Source: HCM2010 Highway Capacity Manual, Transportation Research Board, 2010.

² For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

³ For two-way stop controlled intersections, the LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole at two-way stop controlled intersections. For approach-based and intersection-wide assessments at all-way stop controlled intersections, LOS is solely defined by control delay.

2018 Existing

Lanes, Volumes, Timings
1: W Valley Hwy & S 287th St

06/14/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	5	13	634	258	6
Future Volume (vph)	3	5	13	634	258	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			40	40	
Link Distance (ft)	1336			1218	847	
Travel Time (s)	36.4			20.8	14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	39%	10%	11%	50%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other




Control Type: Unsignalized

HCM 6th TWSC
1: W Valley Hwy & S 287th St

06/14/2019

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	13	634	258	6
Future Vol, veh/h	3	5	13	634	258	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	39	10	11	50
Mvmt Flow	3	5	14	689	280	7

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1001	284	287
Stage 1	284	-	-
Stage 2	717	-	-
Critical Hdwy	6.4	6.2	4.49
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.551
Pot Cap-1 Maneuver	271	760	1090
Stage 1	769	-	-
Stage 2	487	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	265	760	1090
Mov Cap-2 Maneuver	265	-	-
Stage 1	753	-	-
Stage 2	487	-	-


Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1090	-	447	-	-
HCM Lane V/C Ratio	0.013	-	0.019	-	-
HCM Control Delay (s)	8.3	0	13.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings

2: W Valley Hwy /W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	180	77	44	35	77	37	496	105	77	148	11
Future Volume (vph)	84	180	77	44	35	77	37	496	105	77	148	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		735			1099			749			366	
Travel Time (s)		16.7			21.4			12.8			6.2	
Confl. Peds. (#/hr)									1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	21%	21%	21%	10%	10%	10%	13%	13%	13%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

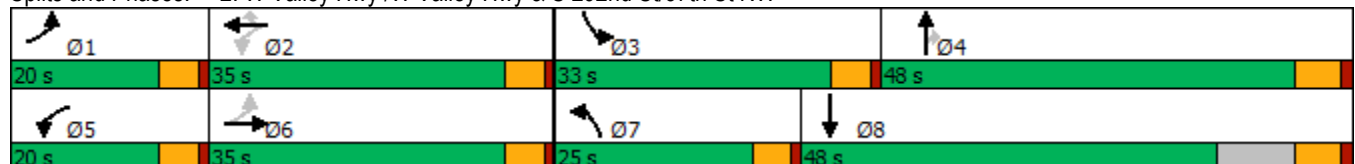
Cycle Length: 136

Actuated Cycle Length: 99.6

Natural Cycle: 85

Control Type: Actuated-Uncoordinated
























Splits and Phases: 2: W Valley Hwy /W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy /W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	180	77	44	35	77	37	496	105	77	148	11
Future Volume (veh/h)	84	180	77	44	35	77	37	496	105	77	148	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1589	1589	1589	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	92	198	85	48	38	0	41	545	0	85	163	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	21	21	21	10	10	10	13	13	13
Cap, veh/h	438	254	109	217	299	254	65	683		109	656	48
Arrive On Green	0.06	0.20	0.20	0.04	0.19	0.00	0.04	0.39	0.00	0.07	0.42	0.42
Sat Flow, veh/h	1781	1241	533	1513	1589	1346	1668	1752	1485	1626	1571	116
Grp Volume(v), veh/h	92	0	283	48	38	0	41	545	0	85	0	175
Grp Sat Flow(s),veh/h/ln	1781	0	1774	1513	1589	1346	1668	1752	1485	1626	0	1687
Q Serve(g_s), s	2.9	0.0	10.7	1.8	1.4	0.0	1.7	19.6	0.0	3.7	0.0	4.8
Cycle Q Clear(g_c), s	2.9	0.0	10.7	1.8	1.4	0.0	1.7	19.6	0.0	3.7	0.0	4.8
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	438	0	363	217	299	254	65	683		109	0	705
V/C Ratio(X)	0.21	0.00	0.78	0.22	0.13	0.00	0.63	0.80		0.78	0.00	0.25
Avail Cap(c_a), veh/h	708	0	749	471	670	568	469	1035		640	0	996
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	26.7	22.4	24.0	0.0	33.7	19.2	0.0	32.7	0.0	13.4
Incr Delay (d2), s/veh	0.2	0.0	4.4	0.5	0.2	0.0	9.6	4.8	0.0	11.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	4.8	0.6	0.5	0.0	0.8	7.8	0.0	1.7	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	31.1	22.9	24.2	0.0	43.2	24.0	0.0	44.2	0.0	13.7
LnGrp LOS	C	A	C	C	C	A	D	C		D	A	B
Approach Vol, veh/h		375			86			586	A		260	
Approach Delay, s/veh		28.8			23.5			25.4			23.7	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	18.4	9.8	33.7	8.1	19.5	7.8	35.7				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	4.9	3.4	5.7	21.6	3.8	12.7	3.7	6.8				
Green Ext Time (p_c), s	0.1	0.2	0.2	6.1	0.1	1.8	0.1	1.4				

Intersection Summary

HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings
1: W Valley Hwy & S 287th St

06/14/2019






Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	11	3	365	774	5
Future Volume (vph)	5	11	3	365	774	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			40	40	
Link Distance (ft)	1336			848	847	
Travel Time (s)	36.4			14.5	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	9%	0%	6%	5%	20%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
























Control Type: Unsignalized

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	11	3	365	774	5
Future Vol, veh/h	5	11	3	365	774	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	9	0	6	5	20
Mvmt Flow	5	12	3	384	815	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1208	818	820	0	-	0
Stage 1	818	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Critical Hdwy	6.4	6.29	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.381	2.2	-	-	-
Pot Cap-1 Maneuver	204	365	818	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	203	365	818	-	-	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.1	0.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	818	-	292	-	-	
HCM Lane V/C Ratio	0.004	-	0.058	-	-	
HCM Control Delay (s)	9.4	0	18.1	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Lanes, Volumes, Timings

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	91	47	116	169	85	106	182	89	115	446	100
Future Volume (vph)	44	91	47	116	169	85	106	182	89	115	446	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		620			775			619			755	
Travel Time (s)		14.1			15.1			10.6			12.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	6%	6%	6%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

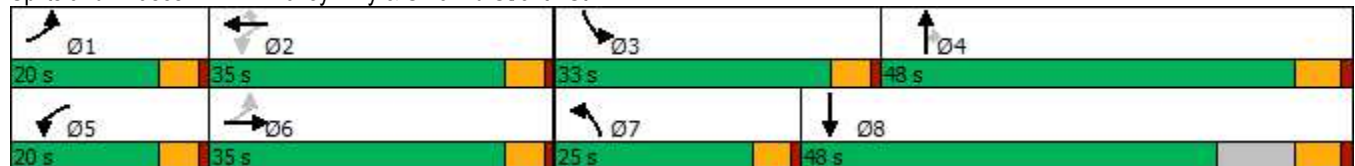
Cycle Length: 136

Actuated Cycle Length: 97.4

Natural Cycle: 85

Control Type: Actuated-Uncoordinated
























Splits and Phases: 2: W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	91	47	116	169	85	106	182	89	115	446	100
Future Volume (veh/h)	44	91	47	116	169	85	106	182	89	115	446	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1781	1781	1781	1811	1811	1811
Adj Flow Rate, veh/h	48	99	51	126	184	0	115	198	0	125	485	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	6	6	6
Cap, veh/h	262	142	73	298	304	257	148	709		163	579	130
Arrive On Green	0.04	0.13	0.13	0.09	0.17	0.00	0.09	0.40	0.00	0.09	0.40	0.40
Sat Flow, veh/h	1725	1126	580	1725	1811	1535	1697	1781	1510	1725	1431	322
Grp Volume(v), veh/h	48	0	150	126	184	0	115	198	0	125	0	594
Grp Sat Flow(s),veh/h/ln	1725	0	1707	1725	1811	1535	1697	1781	1510	1725	0	1753
Q Serve(g_s), s	1.7	0.0	6.0	4.4	6.7	0.0	4.7	5.3	0.0	5.0	0.0	21.6
Cycle Q Clear(g_c), s	1.7	0.0	6.0	4.4	6.7	0.0	4.7	5.3	0.0	5.0	0.0	21.6
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	262	0	215	298	304	257	148	709		163	0	710
V/C Ratio(X)	0.18	0.00	0.70	0.42	0.61	0.00	0.78	0.28		0.77	0.00	0.84
Avail Cap(c_a), veh/h	553	0	724	517	768	651	480	1058		683	0	1041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	29.6	24.0	27.3	0.0	31.6	14.4	0.0	31.3	0.0	18.9
Incr Delay (d2), s/veh	0.3	0.0	4.9	0.9	2.3	0.0	8.4	0.5	0.0	7.4	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	2.6	1.8	2.9	0.0	2.1	2.0	0.0	2.3	0.0	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	0.0	34.5	25.0	29.6	0.0	40.0	14.9	0.0	38.7	0.0	23.9
LnGrp LOS	C	A	C	C	C	A	D	B		D	A	C
Approach Vol, veh/h	198				310				313			
Approach Delay, s/veh	32.4				27.7				24.1			
Approach LOS	C				C				C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	16.9	11.7	34.1	11.0	13.9	11.2	34.6				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	3.7	8.7	7.0	7.3	6.4	8.0	6.7	23.6				
Green Ext Time (p_c), s	0.1	1.1	0.3	2.2	0.2	0.9	0.2	5.1				

Intersection Summary

HCM 6th Ctrl Delay	27.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

2021 Without Project

Lanes, Volumes, Timings

1: W Valley Hwy & S 287th St

06/14/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Volume (vph)	23	10	33	673	274	36
Future Volume (vph)	23	10	33	673	274	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	175			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	25			40	40	
Link Distance (ft)	405			850	386	
Travel Time (s)	11.0			14.5	6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	26%	20%	27%	10%	11%	36%
Parking (#/hr)	0					
Shared Lane Traffic (%)						
Turn Type	Prot		D.P+P	NA	NA	
Protected Phases	6		7	4	8	
Permitted Phases			8			
Detector Phase	6		7	4	8	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.5		10.5	23.5	23.5	
Total Split (s)	25.0		15.0	50.0	50.0	
Total Split (%)	27.8%		16.7%	55.6%	55.6%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	

Intersection Summary

Area Type: Other

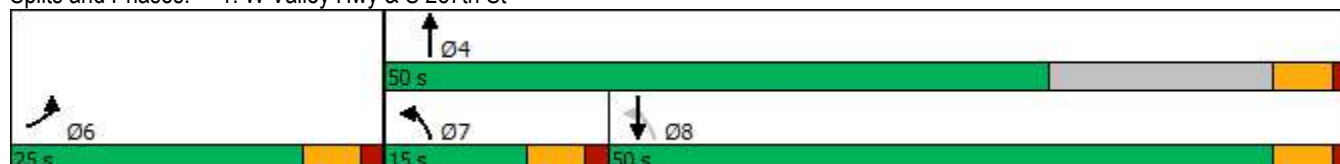
Cycle Length: 90

Actuated Cycle Length: 34.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: W Valley Hwy & S 287th St



HCM 6th Signalized Intersection Summary

1: W Valley Hwy & S 287th St

06/14/2019


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	10	33	673	274	36
Future Volume (veh/h)	23	10	33	673	274	36
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1500	1752	1737	1737
Adj Flow Rate, veh/h	25	11	36	732	298	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	27	10	11	11
Cap, veh/h	42	18	474	1033	547	72
Arrive On Green	0.04	0.04	0.04	0.59	0.36	0.36
Sat Flow, veh/h	941	414	1428	1752	1505	197
Grp Volume(v), veh/h	37	0	36	732	0	337
Grp Sat Flow(s), veh/h/ln	1393	0	1428	1752	0	1702
Q Serve(g_s), s	0.8	0.0	0.5	8.8	0.0	4.7
Cycle Q Clear(g_c), s	0.8	0.0	0.5	8.8	0.0	4.7
Prop In Lane	0.68	0.30	1.00			0.12
Lane Grp Cap(c), veh/h	62	0	474	1033	0	619
V/C Ratio(X)	0.60	0.00	0.08	0.71	0.00	0.54
Avail Cap(c_a), veh/h	904	0	864	2593	0	2519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.1	0.0	5.8	4.3	0.0	7.6
Incr Delay (d2), s/veh	10.8	0.0	0.1	1.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	0.4	0.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.9	0.0	5.9	5.4	0.0	8.5
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	37			768	337	
Approach Delay, s/veh	24.9			5.5	8.5	
Approach LOS	C			A	A	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				23.2	6.8	6.8
Change Period (Y+Rc), s				5.5	5.5	5.5
Max Green Setting (Gmax), s				44.5	19.5	9.5
Max Q Clear Time (g_c+I1), s				10.8	2.8	2.5
Green Ext Time (p_c), s				6.9	0.1	0.0
Intersection Summary						
HCM 6th Ctrl Delay			7.0			
HCM 6th LOS			A			
Notes						

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	191	82	47	37	85	39	540	111	82	162	12
Future Volume (vph)	91	191	82	47	37	85	39	540	111	82	162	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		723			690			638			714	
Travel Time (s)		16.4			13.4			10.9			12.2	
Confl. Peds. (#/hr)									1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	21%	22%	19%	10%	10%	10%	12%	13%	15%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

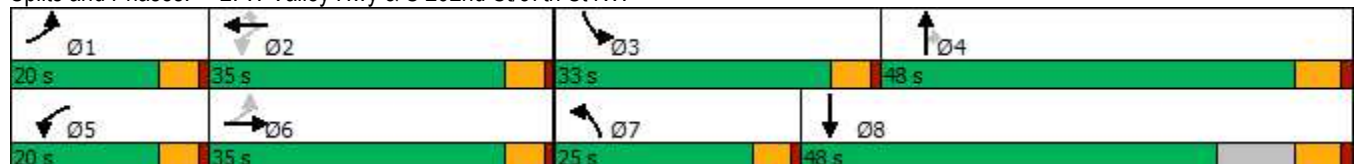
Cycle Length: 136

Actuated Cycle Length: 101.3

Natural Cycle: 85

Control Type: Actuated-Uncoordinated























Splits and Phases: 2: W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	191	82	47	37	85	39	540	111	82	162	12
Future Volume (veh/h)	91	191	82	47	37	85	39	540	111	82	162	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1589	1574	1618	1752	1752	1752	1722	1707	1707
Adj Flow Rate, veh/h	100	210	90	52	41	0	43	593	0	90	178	13
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	21	22	19	10	10	10	12	13	13
Cap, veh/h	436	261	112	203	299	261	65	712		115	689	50
Arrive On Green	0.06	0.21	0.21	0.04	0.19	0.00	0.04	0.41	0.00	0.07	0.44	0.44
Sat Flow, veh/h	1781	1242	532	1513	1574	1372	1668	1752	1485	1640	1572	115
Grp Volume(v), veh/h	100	0	300	52	41	0	43	593	0	90	0	191
Grp Sat Flow(s),veh/h/ln	1781	0	1775	1513	1574	1372	1668	1752	1485	1640	0	1687
Q Serve(g_s), s	3.5	0.0	12.5	2.1	1.7	0.0	2.0	23.7	0.0	4.2	0.0	5.6
Cycle Q Clear(g_c), s	3.5	0.0	12.5	2.1	1.7	0.0	2.0	23.7	0.0	4.2	0.0	5.6
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	436	0	373	203	299	261	65	712		115	0	739
V/C Ratio(X)	0.23	0.00	0.80	0.26	0.14	0.00	0.66	0.83		0.78	0.00	0.26
Avail Cap(c_a), veh/h	665	0	683	429	606	528	428	944		589	0	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	29.3	24.5	26.3	0.0	37.0	20.7	0.0	35.6	0.0	13.9
Incr Delay (d2), s/veh	0.3	0.0	4.9	0.7	0.2	0.0	11.0	6.9	0.0	10.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	5.6	0.8	0.6	0.0	1.0	9.9	0.0	1.9	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.3	0.0	34.2	25.2	26.5	0.0	48.0	27.6	0.0	46.4	0.0	14.1
LnGrp LOS	C	A	C	C	C	A	D	C		D	A	B
Approach Vol, veh/h	400			93			636			A		
Approach Delay, s/veh	31.4			25.8			29.0			24.5		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	19.8	10.5	37.7	8.4	21.4	8.0	40.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	5.5	3.7	6.2	25.7	4.1	14.5	4.0	7.6				
Green Ext Time (p_c), s	0.1	0.2	0.2	6.0	0.1	1.9	0.1	1.5				

Intersection Summary

HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C











Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings

1: W Valley Hwy & S 287th St

06/14/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	32	8	387	821	26
Future Volume (vph)	40	32	8	387	821	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	175			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	25			40	40	
Link Distance (ft)	405			850	192	
Travel Time (s)	11.0			14.5	3.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	33%	22%	25%	6%	5%	31%
Parking (#/hr)	0					
Shared Lane Traffic (%)						
Turn Type	Prot		D.P+P	NA	NA	
Protected Phases	6		7	4	8	
Permitted Phases			8			
Detector Phase	6		7	4	8	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.5		10.5	23.5	23.5	
Total Split (s)	25.0		15.0	50.0	50.0	
Total Split (%)	27.8%		16.7%	55.6%	55.6%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	

Intersection Summary

Area Type: Other

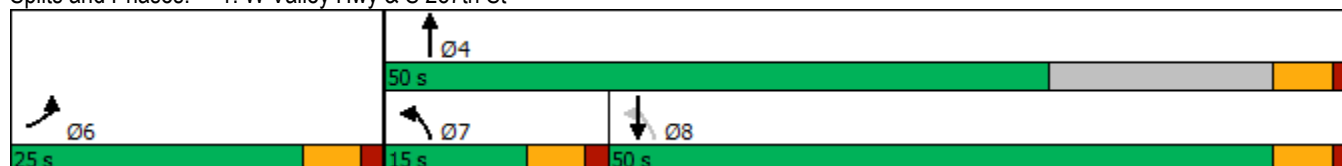
Cycle Length: 90

Actuated Cycle Length: 61.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: W Valley Hwy & S 287th St



HCM 6th Signalized Intersection Summary

1: W Valley Hwy & S 287th St

06/14/2019


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	32	8	387	821	26
Future Volume (veh/h)	40	32	8	387	821	26
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1530	1811	1826	1826
Adj Flow Rate, veh/h	42	34	8	407	864	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	25	6	5	5
Cap, veh/h	47	38	262	1292	1046	33
Arrive On Green	0.07	0.07	0.01	0.71	0.59	0.59
Sat Flow, veh/h	695	563	1457	1811	1761	55
Grp Volume(v), veh/h	77	0	8	407	0	891
Grp Sat Flow(s),veh/h/ln	1275	0	1457	1811	0	1816
Q Serve(g_s), s	3.0	0.0	0.1	4.2	0.0	19.7
Cycle Q Clear(g_c), s	3.0	0.0	0.1	4.2	0.0	19.7
Prop In Lane	0.55	0.44	1.00			0.03
Lane Grp Cap(c), veh/h	87	0	262	1292	0	1078
V/C Ratio(X)	0.89	0.00	0.03	0.31	0.00	0.83
Avail Cap(c_a), veh/h	493	0	521	1599	0	1604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	7.9	2.7	0.0	8.2
Incr Delay (d2), s/veh	27.4	0.0	0.1	0.2	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.4	0.0	4.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	50.7	0.0	7.9	2.8	0.0	10.8
LnGrp LOS	D	A	A	A	A	B
Approach Vol, veh/h	77			415	891	
Approach Delay, s/veh	50.7			2.9	10.8	
Approach LOS	D			A	B	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				41.5	8.9	6.0
Change Period (Y+Rc), s				5.5	5.5	5.5
Max Green Setting (Gmax), s				44.5	19.5	9.5
Max Q Clear Time (g_c+I1), s				6.2	5.0	2.1
Green Ext Time (p_c), s				3.1	0.2	0.0
Intersection Summary						
HCM 6th Ctrl Delay			10.7			
HCM 6th LOS			B			
Notes						

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	97	50	123	179	90	112	198	94	125	487	109
Future Volume (vph)	47	97	50	123	179	90	112	198	94	125	487	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		747			691			485			751	
Travel Time (s)		17.0			13.5			8.3			12.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	5%	6%	6%	6%	6%	8%	8%	7%	6%	6%	6%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

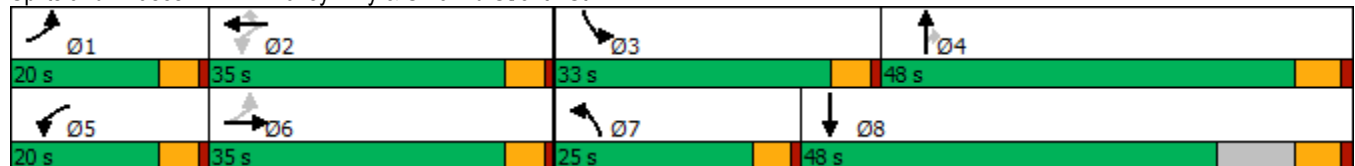
Cycle Length: 136

Actuated Cycle Length: 102.9

Natural Cycle: 85

Control Type: Actuated-Uncoordinated
























Splits and Phases: 2: W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy & S 292nd St/37th St NW

06/14/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	97	50	123	179	90	112	198	94	125	487	109
Future Volume (veh/h)	47	97	50	123	179	90	112	198	94	125	487	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1826	1826	1811	1811	1811	1781	1781	1796	1811	1811	1811
Adj Flow Rate, veh/h	51	105	54	134	195	0	122	215	0	136	529	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	5	5	6	6	6	8	8	7	6	6	6
Cap, veh/h	250	144	74	290	313	265	156	739		174	608	136
Arrive On Green	0.04	0.13	0.13	0.09	0.17	0.00	0.09	0.41	0.00	0.10	0.42	0.42
Sat Flow, veh/h	1725	1136	584	1725	1811	1535	1697	1781	1522	1725	1434	320
Grp Volume(v), veh/h	51	0	159	134	195	0	122	215	0	136	0	647
Grp Sat Flow(s), veh/h/ln	1725	0	1721	1725	1811	1535	1697	1781	1522	1725	0	1754
Q Serve(g_s), s	2.0	0.0	6.9	5.1	7.8	0.0	5.5	6.3	0.0	6.0	0.0	26.3
Cycle Q Clear(g_c), s	2.0	0.0	6.9	5.1	7.8	0.0	5.5	6.3	0.0	6.0	0.0	26.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	250	0	219	290	313	265	156	739		174	0	743
V/C Ratio(X)	0.20	0.00	0.73	0.46	0.62	0.00	0.78	0.29		0.78	0.00	0.87
Avail Cap(c_a), veh/h	507	0	661	469	696	589	434	958		618	0	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	32.8	26.0	30.0	0.0	34.7	15.2	0.0	34.3	0.0	20.5
Incr Delay (d2), s/veh	0.4	0.0	5.5	1.1	2.5	0.0	8.3	0.5	0.0	7.4	0.0	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	3.1	2.1	3.5	0.0	2.5	2.4	0.0	2.7	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	0.0	38.3	27.2	32.4	0.0	43.1	15.7	0.0	41.7	0.0	28.6
LnGrp LOS	C	A	D	C	C	A	D	B		D	A	C
Approach Vol, veh/h	210				329				337			
Approach Delay, s/veh	35.8				30.3				25.6			
Approach LOS	D				C				C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	18.5	12.9	38.4	11.9	14.9	12.2	39.1				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	4.0	9.8	8.0	8.3	7.1	8.9	7.5	28.3				
Green Ext Time (p_c), s	0.1	1.1	0.3	2.4	0.2	1.0	0.2	4.8				

Intersection Summary

HCM 6th Ctrl Delay	30.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

2021 With Project

Lanes, Volumes, Timings

1: W Valley Hwy & S 287th St

09/13/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	24	10	33	698	277	36
Future Volume (vph)	24	10	33	698	277	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	175			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	25			40	40	
Link Distance (ft)	810			850	773	
Travel Time (s)	22.1			14.5	13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	20%	27%	10%	11%	36%
Parking (#/hr)	0					
Shared Lane Traffic (%)						
Turn Type	Prot		D.P+P	NA	NA	
Protected Phases	6		7	4	8	
Permitted Phases			8			
Detector Phase	6		7	4	8	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.5		10.5	23.5	23.5	
Total Split (s)	25.0		15.0	50.0	50.0	
Total Split (%)	27.8%		16.7%	55.6%	55.6%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	

Intersection Summary

Area Type: Other

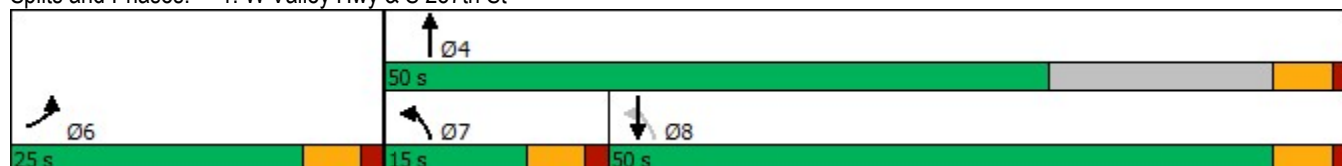
Cycle Length: 90

Actuated Cycle Length: 35.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: W Valley Hwy & S 287th St



HCM 6th Signalized Intersection Summary

1: W Valley Hwy & S 287th St

09/13/2019


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	24	10	33	698	277	36
Future Volume (veh/h)	24	10	33	698	277	36
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1500	1752	1737	1737
Adj Flow Rate, veh/h	26	11	36	759	301	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	27	10	11	11
Cap, veh/h	43	18	483	1054	576	75
Arrive On Green	0.04	0.04	0.04	0.60	0.38	0.38
Sat Flow, veh/h	963	408	1428	1752	1507	195
Grp Volume(v), veh/h	38	0	36	759	0	340
Grp Sat Flow(s),veh/h/ln	1408	0	1428	1752	0	1702
Q Serve(g_s), s	0.8	0.0	0.5	9.5	0.0	4.8
Cycle Q Clear(g_c), s	0.8	0.0	0.5	9.5	0.0	4.8
Prop In Lane	0.68	0.29	1.00			0.11
Lane Grp Cap(c), veh/h	63	0	483	1054	0	650
V/C Ratio(X)	0.60	0.00	0.07	0.72	0.00	0.52
Avail Cap(c_a), veh/h	882	0	857	2504	0	2432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	5.7	4.4	0.0	7.4
Incr Delay (d2), s/veh	10.5	0.0	0.1	1.1	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.1	0.5	0.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.1	0.0	5.7	5.5	0.0	8.2
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	38			795	340	
Approach Delay, s/veh	25.1			5.5	8.2	
Approach LOS	C			A	A	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				24.2	6.9	6.8
Change Period (Y+Rc), s				5.5	5.5	5.5
Max Green Setting (Gmax), s				44.5	19.5	9.5
Max Q Clear Time (g_c+I1), s				11.5	2.8	2.5
Green Ext Time (p_c), s				7.3	0.1	0.0
Intersection Summary						
HCM 6th Ctrl Delay			6.9			
HCM 6th LOS			A			
Notes						

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings

2: W Valley Hwy & S 292nd St/37th St NW

09/13/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	191	82	47	37	91	39	556	111	83	164	12
Future Volume (vph)	94	191	82	47	37	91	39	556	111	83	164	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		624			798			696			724	
Travel Time (s)		14.2			15.5			11.9			12.3	
Confl. Peds. (#/hr)									1			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	21%	22%	19%	10%	10%	10%	12%	13%	17%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

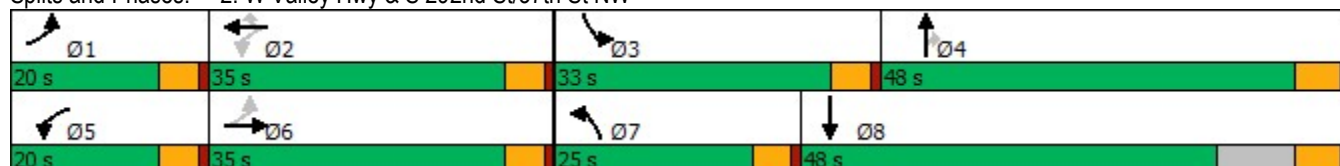
Cycle Length: 136

Actuated Cycle Length: 102.2

Natural Cycle: 85

Control Type: Actuated-Uncoordinated























Splits and Phases: 2: W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy & S 292nd St/37th St NW

09/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	191	82	47	37	91	39	556	111	83	164	12
Future Volume (veh/h)	94	191	82	47	37	91	39	556	111	83	164	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1589	1574	1618	1752	1752	1752	1722	1707	1707
Adj Flow Rate, veh/h	103	210	90	52	41	0	43	611	0	91	180	13
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	21	22	19	10	10	10	12	13	13
Cap, veh/h	432	260	111	199	294	256	64	724		117	702	51
Arrive On Green	0.07	0.21	0.21	0.04	0.19	0.00	0.04	0.41	0.00	0.07	0.45	0.45
Sat Flow, veh/h	1781	1242	532	1513	1574	1372	1668	1752	1485	1640	1573	114
Grp Volume(v), veh/h	103	0	300	52	41	0	43	611	0	91	0	193
Grp Sat Flow(s),veh/h/ln	1781	0	1775	1513	1574	1372	1668	1752	1485	1640	0	1687
Q Serve(g_s), s	3.7	0.0	12.8	2.2	1.7	0.0	2.0	25.0	0.0	4.4	0.0	5.7
Cycle Q Clear(g_c), s	3.7	0.0	12.8	2.2	1.7	0.0	2.0	25.0	0.0	4.4	0.0	5.7
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	432	0	371	199	294	256	64	724		117	0	753
V/C Ratio(X)	0.24	0.00	0.81	0.26	0.14	0.00	0.67	0.84		0.78	0.00	0.26
Avail Cap(c_a), veh/h	651	0	668	419	592	516	418	923		576	0	889
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	30.0	25.3	27.1	0.0	37.8	21.1	0.0	36.4	0.0	13.8
Incr Delay (d2), s/veh	0.3	0.0	5.0	0.7	0.3	0.0	11.4	7.7	0.0	10.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	5.8	0.8	0.6	0.0	1.0	10.6	0.0	2.0	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	0.0	35.1	26.0	27.3	0.0	49.2	28.8	0.0	47.1	0.0	14.1
LnGrp LOS	C	A	D	C	C	A	D	C		D	A	B
Approach Vol, veh/h	403			93			654			284		
Approach Delay, s/veh	32.2			26.6			30.1			24.6		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	19.9	10.7	39.0	8.4	21.7	8.1	41.6				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	5.7	3.7	6.4	27.0	4.2	14.8	4.0	7.7				
Green Ext Time (p_c), s	0.1	0.2	0.2	5.9	0.1	1.8	0.1	1.6				

Intersection Summary

HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings

3: W Valley Hwy & Site Access

09/13/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	3	25	697	309	39
Future Volume (vph)	5	3	25	697	309	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			40	40	
Link Distance (ft)	411			773	321	
Travel Time (s)	11.2			13.2	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	11%	14%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	

Intersection Summary






Area Type: Other

Control Type: Unsignalized

HCM 6th TWSC

3: W Valley Hwy & Site Access

09/13/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	3	25	697	309	39
Future Vol, veh/h	5	3	25	697	309	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	11	14	0
Mvmt Flow	5	3	27	758	336	42

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1169	357	378	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	215	692	1192	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	210	692	1192	-	-	-
Mov Cap-2 Maneuver	210	-	-	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	440	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.1	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1192	-	284	-	-
HCM Lane V/C Ratio	0.023	-	0.031	-	-
HCM Control Delay (s)	8.1	-	18.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Lanes, Volumes, Timings

1: W Valley Hwy & S 287th St

09/13/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	32	8	390	841	26
Future Volume (vph)	43	32	8	390	841	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	175			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Right Turn on Red		Yes				Yes
Link Speed (mph)	25			40	40	
Link Distance (ft)	810			850	773	
Travel Time (s)	22.1			14.5	13.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	30%	22%	25%	6%	5%	31%
Parking (#/hr)	0					
Shared Lane Traffic (%)						
Turn Type	Prot		D.P+P	NA	NA	
Protected Phases	6		7	4	8	
Permitted Phases			8			
Detector Phase	6		7	4	8	
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	
Minimum Split (s)	23.5		10.5	23.5	23.5	
Total Split (s)	25.0		15.0	50.0	50.0	
Total Split (%)	27.8%		16.7%	55.6%	55.6%	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	1.5		1.5	1.5	1.5	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.5		5.5	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None		None	None	None	

Intersection Summary

Area Type: Other

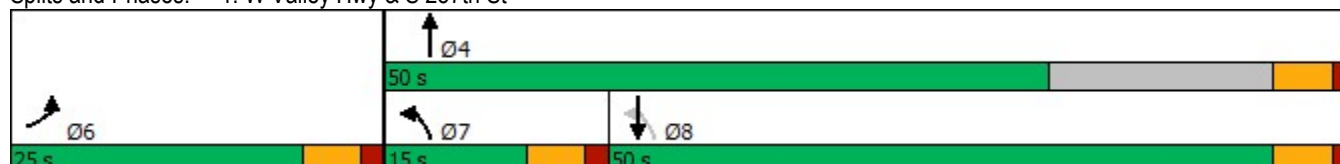
Cycle Length: 90

Actuated Cycle Length: 63.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: W Valley Hwy & S 287th St



HCM 6th Signalized Intersection Summary

1: W Valley Hwy & S 287th St

09/13/2019


























Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	32	8	390	841	26
Future Volume (veh/h)	43	32	8	390	841	26
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1530	1811	1826	1826
Adj Flow Rate, veh/h	45	34	8	411	885	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	25	6	5	5
Cap, veh/h	52	39	254	1300	1060	32
Arrive On Green	0.07	0.07	0.01	0.72	0.60	0.60
Sat Flow, veh/h	741	560	1457	1811	1762	54
Grp Volume(v), veh/h	80	0	8	411	0	912
Grp Sat Flow(s),veh/h/ln	1318	0	1457	1811	0	1816
Q Serve(g_s), s	3.1	0.0	0.1	4.3	0.0	20.9
Cycle Q Clear(g_c), s	3.1	0.0	0.1	4.3	0.0	20.9
Prop In Lane	0.56	0.42	1.00			0.03
Lane Grp Cap(c), veh/h	92	0	254	1300	0	1092
V/C Ratio(X)	0.87	0.00	0.03	0.32	0.00	0.84
Avail Cap(c_a), veh/h	496	0	505	1555	0	1559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	8.2	2.7	0.0	8.3
Incr Delay (d2), s/veh	23.7	0.0	0.1	0.2	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.4	0.0	5.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.5	0.0	8.3	2.8	0.0	11.4
LnGrp LOS	D	A	A	A	A	B
Approach Vol, veh/h	80			419	912	
Approach Delay, s/veh	47.5			2.9	11.4	
Approach LOS	D			A	B	
Timer - Assigned Phs				4	6	7
Phs Duration (G+Y+Rc), s				42.7	9.1	6.0
Change Period (Y+Rc), s				5.5	5.5	5.5
Max Green Setting (Gmax), s				44.5	19.5	9.5
Max Q Clear Time (g_c+I1), s				6.3	5.1	2.1
Green Ext Time (p_c), s				3.2	0.2	0.0
Intersection Summary						
HCM 6th Ctrl Delay			10.9			
HCM 6th LOS			B			
Notes						

User approved volume balancing among the lanes for turning movement.

Lanes, Volumes, Timings

2: W Valley Hwy & S 292nd St/37th St NW

09/13/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	97	50	123	179	91	112	200	94	130	500	111
Future Volume (vph)	47	97	50	123	179	91	112	200	94	130	500	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	150		0	125		0	125		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			35			40			40	
Link Distance (ft)		725			710			661			759	
Travel Time (s)		16.5			13.8			11.3			12.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	5%	6%	6%	6%	6%	8%	9%	7%	6%	6%	6%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2			4			
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	10.0	29.0		10.0	26.0	26.0	10.0	29.0	29.0	10.0	34.0	
Total Split (s)	20.0	35.0		20.0	35.0	35.0	25.0	48.0	48.0	33.0	48.0	
Total Split (%)	14.7%	25.7%		14.7%	25.7%	25.7%	18.4%	35.3%	35.3%	24.3%	35.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.5	4.5	4.0	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.5	1.5	1.0	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	6.0	6.0	5.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	

Intersection Summary

Area Type: Other

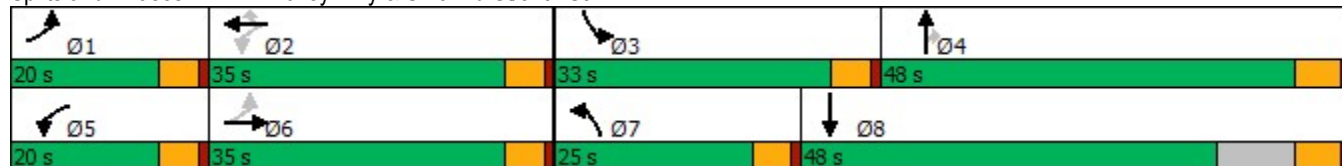
Cycle Length: 136

Actuated Cycle Length: 102.9

Natural Cycle: 85

Control Type: Actuated-Uncoordinated
























Splits and Phases: 2: W Valley Hwy & S 292nd St/37th St NW



HCM 6th Signalized Intersection Summary

2: W Valley Hwy & S 292nd St/37th St NW











09/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	97	50	123	179	91	112	200	94	130	500	111
Future Volume (veh/h)	47	97	50	123	179	91	112	200	94	130	500	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1811	1826	1826	1811	1811	1811	1781	1767	1796	1811	1811	1811
Adj Flow Rate, veh/h	51	105	54	134	195	0	122	217	0	141	543	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	5	5	6	6	6	8	9	7	6	6	6
Cap, veh/h	246	144	74	287	312	264	155	738		180	617	138
Arrive On Green	0.04	0.13	0.13	0.09	0.17	0.00	0.09	0.42	0.00	0.10	0.43	0.43
Sat Flow, veh/h	1725	1136	584	1725	1811	1535	1697	1767	1522	1725	1434	320
Grp Volume(v), veh/h	51	0	159	134	195	0	122	217	0	141	0	664
Grp Sat Flow(s),veh/h/ln	1725	0	1721	1725	1811	1535	1697	1767	1522	1725	0	1754
Q Serve(g_s), s	2.0	0.0	7.1	5.2	8.0	0.0	5.6	6.5	0.0	6.4	0.0	27.7
Cycle Q Clear(g_c), s	2.0	0.0	7.1	5.2	8.0	0.0	5.6	6.5	0.0	6.4	0.0	27.7
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	246	0	217	287	312	264	155	738		180	0	755
V/C Ratio(X)	0.21	0.00	0.73	0.47	0.63	0.00	0.79	0.29		0.79	0.00	0.88
Avail Cap(c_a), veh/h	498	0	648	459	682	578	426	931		606	0	924
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	33.5	26.6	30.6	0.0	35.4	15.4	0.0	34.8	0.0	20.8
Incr Delay (d2), s/veh	0.4	0.0	5.6	1.2	2.5	0.0	8.4	0.5	0.0	7.4	0.0	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	3.2	2.1	3.5	0.0	2.6	2.5	0.0	2.9	0.0	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	0.0	39.1	27.7	33.1	0.0	43.9	15.9	0.0	42.2	0.0	29.9
LnGrp LOS	C	A	D	C	C	A	D	B		D	A	C
Approach Vol, veh/h	210			329			339			A		
Approach Delay, s/veh	36.7			30.9			25.9			32.1		
Approach LOS	D			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	18.7	13.3	39.3	12.0	15.1	12.3	40.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	6.0	5.0	5.0	5.0	6.0				
Max Green Setting (Gmax), s	15.0	30.0	28.0	42.0	15.0	30.0	20.0	42.0				
Max Q Clear Time (g_c+I1), s	4.0	10.0	8.4	8.5	7.2	9.1	7.6	29.7				
Green Ext Time (p_c), s	0.1	1.1	0.3	2.4	0.2	1.0	0.2	4.7				
Intersection Summary												
HCM 6th Ctrl Delay	31.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings

3: W Valley Hwy & Site Access






09/13/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	27	20	3	429	846	5
Future Volume (vph)	27	20	3	429	846	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			40	40	
Link Distance (ft)	411			773	321	
Travel Time (s)	11.2			13.2	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	9%	6%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC

3: W Valley Hwy & Site Access

09/13/2019

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	20	3	429	846	5
Future Vol, veh/h	27	20	3	429	846	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	9	6	0
Mvmt Flow	29	22	3	466	920	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1395	923	925	0	-	0
Stage 1	923	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	157	330	747	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	156	330	747	-	-	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	28.9	0.1		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	747	-	201	-	-	
HCM Lane V/C Ratio	0.004	-	0.254	-	-	
HCM Control Delay (s)	9.8	-	28.9	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	1	-	-	